



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,703	09/25/2003	John D. Irish	ROC920030090US1	6165
30206 7590 10/16/2008 IBM CORPORATION ROCHESTER IP LAW DEPT. 917 3605 HIGHWAY 52 NORTH ROCHESTER, MN 55901-7829				
EXAMINER ROJAS, MEDYS				
ART UNIT		PAPER NUMBER		
2185				
MAIL DATE		DELIVERY MODE		
10/16/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

## Application No.

10/670,703

## Applicant(s)

IRISH ET AL.

## Examiner

MIDYS ROJAS

## Art Unit

2185

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/CB/CIC)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments, filed on 7/24/08, have been considered but are not persuasive.

Applicant argues that the references relied upon do not teach dynamic allocation size being the smallest sized group entry necessary to store the portion of the set of data and that to conclude otherwise would be to completely remove any patentable weight from the terms "smallest" and "necessary". Furthermore, Applicant argues that Bonola's process merely seeks to reduce the size of the remaining half to a threshold size.

The examiner does not agree.

First, the examiner would like to point out that in interpreting the limitation "smallest sized group entry necessary to store the portion of the set of data", the examiner must consider that this "smallest size" that is "necessary" is a determination that is being made by the system that is performing the method of the invention. Based on this rationale, the examiner maintains that for the purposes of the invention of Bonola, the smallest size needed is equivalent to a heap sub region that is less than twice the memory required for the application. The system of Bonola continues to partition the sub region until it reaches this smallest required size, wherein this smallest required size is the smallest size that this system considers to be necessary. Therefore, the size of the yielded sub region is representative of the smallest sized group entry necessary to store the alleged portion of the alleged set of data.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-34 are rejected under 35 U.S.C. 103(a) as being obvious over Bonola (2001/0011338) in view of Applicant's Admitted Prior Art (Page 1 of Specification).

Regarding Claim 1, Bonola discloses a method comprising:

receiving a set of data (in the process of executing an instruction within an application program, paragraph 0013);

determining whether a free entry of a size required by a portion of the set of data exists in one of a plurality of sections of a memory (executes HeapAlloc... examine heap data structure [to] determine if there is an appropriately sized heap sub-region in the free list wherein the free list contains unassigned heap sub-regions, paragraph 0037);

determining whether the memory includes one or more sections of an unallocated size (unassigned heap sub-region, paragraph 0034-0035); and

if a free group entry of the size required by the portion of the set of data does not exist in one of the plurality of sections of the memory (if N exceeds M, then there is no heap sub-region within the heap that can accommodate the demand..., paragraph 0038), determining whether the memory includes one or more sections of an unallocated size; and if the memory includes one or more sections of an unallocated

size, allocating one of the sections of an unallocated size to the size required by the portion of the set of data thereby creating a section of a dynamically allocated size, the section of the dynamically allocated size including one or more group entries of the size required by the portion of the set of data (see paragraph 039, address of the higher memory address is entered into the N list of the free list... of the remaining half of the heap sub-region contains twice as much memory as is required by the requesting application, the remaining half of the heap sub-region can be further divided in half... steps are repeated until a heap sub-region is yielded which does not have twice as much memory as is required. The sub-region is then assigned to the application),

the dynamically allocated size being the smallest sized group entry necessary to store the portion of the set of data (for the purposes of the invention of Bonola, the smallest size needed is equivalent to a heap sub region that is less than twice the memory required for the application. The system of Bonola continues to partition the sub region until it reaches this smallest required size. Therefore, the size of the yielded sub region is representative of the smallest sized group entry necessary to store the alleged portion of the alleged set of data, see paragraph 0039)

The unallocated memory of Bonola's invention is not allocated to an application, however, it is allocated to a heap data structure holding free memory areas.

Bonola does not teach the storage of group entries and the memory being pre-allocated with a group size. Applicant's Admitted Prior Art discloses the storage of data using group entries and pre-allocating the memory by dividing the memory into one or more sections of an anticipated group size (Specification, page 1, paragraph 2). It

would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Bonola to include the storage of data using group entries and the pre-allocation of memory with a group size since this method of memory allocation provides for efficient allocation for networked systems.

Regarding Claim 2, Bonola discloses a method wherein determining whether a free group entry of the size required by the portion of the set of data exists in one of a plurality of sections of the memory includes determining whether a free group entry of the size required by the portion of the set of data for uniquely identifying each portion of the set of data exists in one of the plurality of sections of memory (...no heap sub-region within heap 302 can accommodate a demand for X bytes of memory from application 202, paragraph 0038 wherein the memory is allocated to the heap data structure).

Regarding Claim 3, Bonola discloses a method wherein determining whether the memory includes one or more sections of an unallocated size includes accessing a control structure for one or more sections of the memory, the control structure storing information about the structure of a section (heap data structure 304).

Regarding Claim 4, Bonola discloses a method further comprising, from the section of a dynamically allocated size, allocating an initial group entry of the size required by the portion of the set of data for storing the portion of the set of data (... the address of the heap sub-region contained in the entry is then assigned to the application, paragraph 0037)

Regarding Claim 5, Bonola discloses a method further comprising: receiving a modified set of data; determining whether a portion of the modified set of data may be

stored more efficiently in a group entry of a different size from another section of the memory such that the aggregate number of unused entries in the group entries used for storing the modified set of data is minimized (...if the remaining half of the heap sub-region contains twice as much memory as is required by the requesting application, the remaining half of the heap sub-region can be further divided..., paragraph 0039); allocating a group entry of the different size required by the portion of the modified set of data from another section of the memory to store the portion of the modified set of data (repeating steps 532-540 until a heap sub-region is yielded which does not have twice as much memory as is required and then assigning the sub-region to the application... paragraph 0039); and de-allocating the initial group entry to the section of memory from which the initial group entry was allocated (wherein de-allocation of the initial group entry occurs when the newly selected heap sub-region is placed in the N list and replaces the initial entry, Figure 5).

Regarding Claim 6, Bonola discloses a method further comprising updating the control structure that stores information about the structure of the other section (...an entry is removed from the N list in the free list 306, paragraph 0038).

Regarding Claim 7, Bonola discloses a method further comprising updating the control structure that stores information about the structure of the section of memory from which the initial group entry was allocated (...an entry is removed from the N list in the free list 306, paragraph 0038).

Regarding Claim 8, Bonola discloses a method wherein de-allocating the initial group entry to the section of memory from which the initial group entry was allocated

leaves all entries of the section unused (when the application is finished using an assigned heap sub-region, it can return the heap sub-region to the heap using the HeapFree instruction, thus leaving those entries unused, paragraph 0040).

Regarding Claim 9, Bonola discloses a method further comprising clearing the group entry size allocation of the section (HeapFree instruction clears the allocation of the sections since the heap contains unassigned memory, paragraph 0040-0041).

Regarding Claim 10, Bonola discloses a method further comprising, if the memory does not include one or more sections of an unallocated size, determining whether a free group entry of a size larger than the size required by the portion of the data exists (Paragraph 0039, heap sub-region with the higher memory address is entered into the N list...), wherein sections allocated to the smallest available size larger than the size required by the portion of the data are checked prior to sections allocated to larger available sizes (continue dividing sub-region in half until sub-region contains less than twice as much memory as required).

Regarding Claim 11, Bonola discloses a method further comprising, if a free group entry of a size larger than the size required by the portion of the data exists in a section allocated to a size larger than the size required by the portion of data, allocating an initial group entry of the size larger than the size required by the portion of the set of data from the section allocated to a size larger than the size required by the portion of the data for storing the portion of the set of data (paragraph 0039, if the sub-region contains less than twice as much memory as needed... the sub-region should be assigned).



Regarding Claim 12, Bonola discloses a method further comprising, if a free group entry of a size larger than the size required by the portion of the data does not exist outputting an error condition (Paragraph 0038, there is no sub-region within the heap that can accommodate a demand for X bytes... HeapAlloc instruction will fail...).

Claim 13 is rejected using the same rationale as that of Claim 5.

Claim 14 is rejected using the same rationale as that of Claim 6.

Claim 15 is rejected using the same rationale as that of Claim 7.

Claim 16 is rejected using the same rationale as that of Claim 8.

Claim 17 is rejected using the same rationale as that of Claim 9.

Claim 18 is rejected using the same rationale as that of Claim 1 wherein the memory is represented by system memory 114, the plurality of registers are within heap data structure 304, and the dynamic allocation logic is equivalent to the method for dynamically allocating memory in a computer system of the invention (paragraph 0013, and Figure 3).

Claim 19 is rejected using the same rationale as that of Claim 2.

Claim 20 is rejected using the same rationale as that of Claim 3.

Claim 21 is rejected using the same rationale as that of Claim 4.

Claim 22 is rejected using the same rationale as that of Claim 5.

Claim 23 is rejected using the same rationale as that of Claim 6.

Claim 24 is rejected using the same rationale as that of Claim 7.

Claim 25 is rejected using the same rationale as that of Claim 8.

Claim 26 is rejected using the same rationale as that of Claim 9.

Claim 27 is rejected using the same rationale as that of Claim 10.

Claim 28 is rejected using the same rationale as that of Claim 11.

Claim 29 is rejected using the same rationale as that of Claim 12.

Claim 30 is rejected using the same rationale as that of Claim 5.

Claim 31 is rejected using the same rationale as that of Claim 6.

Claim 32 is rejected using the same rationale as that of Claim 7.

Claim 33 is rejected using the same rationale as that of Claim 8.

Claim 34 is rejected using the same rationale as that of Claim 9.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MIDYS ROJAS whose telephone number is (571)272-4207. The examiner can normally be reached on M-TH 6:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sanjiv Shah can be reached on (571) 272-4098. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Midys Rojas/  
Examiner, Art Unit 2185

MR

/Sanjiv Shah/  
Supervisory Patent Examiner, Art Unit 2185

**Application Number****Application/Control No.**

10/670,703

**Examiner**

MIDYS ROJAS

**Applicant(s)/Patent under  
Reexamination**

IRISH ET AL.

**Art Unit**

2185